

**REDACTED – FOR PUBLIC INSPECTION**

November 3, 2017

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VIA ECFS

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, DC 20554

**Re: In the Matter of Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters, IB Docket No. 16-408**

Dear Ms. Dortch:

On November 1, 2017, Greg Wyler, Founder and Executive Chairman of WorldVu Satellites Ltd. operating as “OneWeb,” David Carmen, President and CEO of the Carmen Group, Jonathon Sine of the Carmen Group, and the undersigned met with Chairman Pai and Rachael Bender of Chairman Pai’s office. During the meeting, OneWeb discussed the default sharing mechanism among NGSO FSS systems adopted by the Commission in its recent Report and Order.<sup>1</sup> OneWeb explained that this mechanism reduces the efficiency of satellites when operating within the U.S., which will degrade available service and ultimately harm consumers.<sup>2</sup> OneWeb showed the attached during the meeting.

Please contact me if you have any questions regarding these matters.

Sincerely,

/s/ Samuel L. Feder

Samuel L. Feder  
*Counsel for OneWeb*

cc: Chairman Pai  
Rachael Bender

Attachment

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<sup>1</sup> Report and Order and Further Notice of Proposed Rulemaking, *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, IB Docket No. 16-408, FCC No. 17-122 ¶¶ 45-50 (Sept. 27, 2017) (“Report and Order”).

<sup>2</sup> See Letter from Mariah D. Shuman, OneWeb, to Marlene Dortch, IB Docket No. 16-408 (Sept. 20, 2017).





# OneWeb

**ACCESS FOR EVERYONE**

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Chairman Ajit Pai





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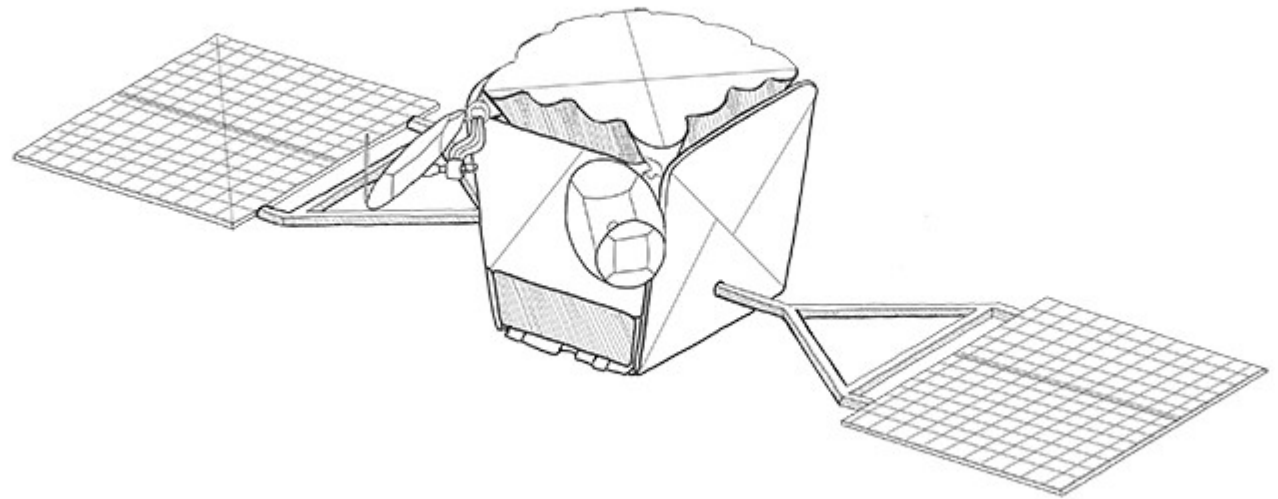


# Our Proprietary Satellites Are State-Of-The-Art

## Mass Produced Satellites

### OneWeb Satellites

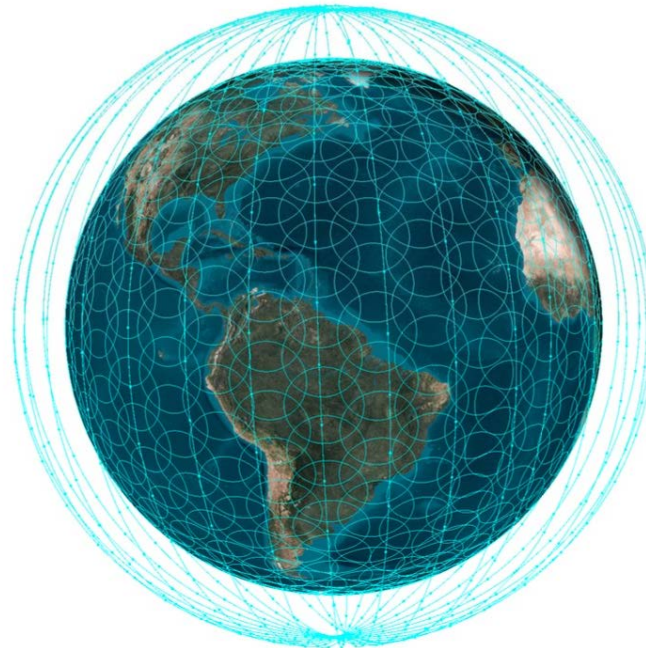
- Fewer components
- Lighter weight
- Easier to manufacture
- Cheaper to launch
- Most efficient Kg/Gbps





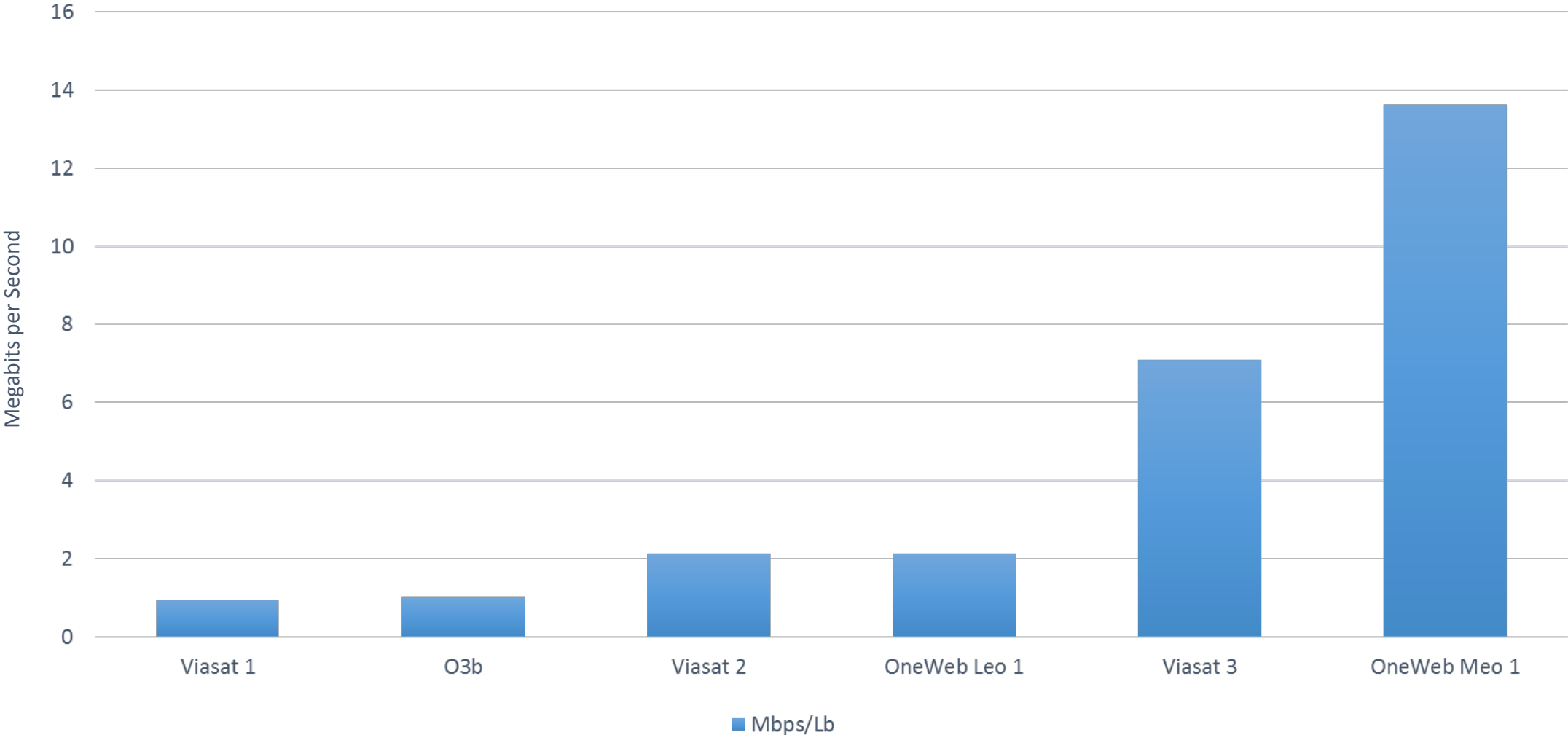
Building thousands of proprietary satellites, organizing hundreds of rockets for launch, and connecting billions to our system and services...

But that is exactly how OneWeb is bridging the Digital Divide





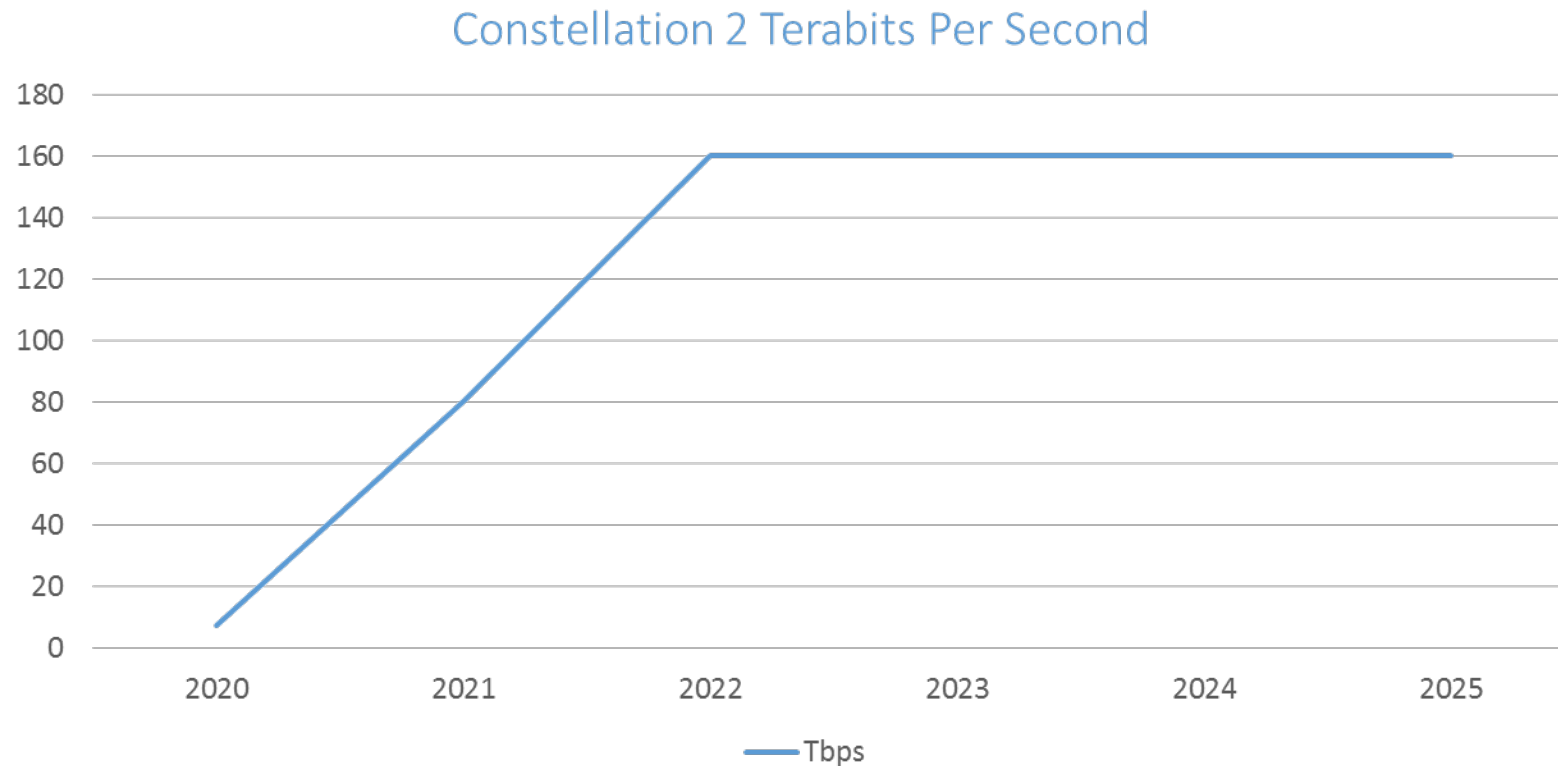
# Satellite Mass Efficiency in Mbps/Lb





OneWeb's capacity resembles terrestrial systems more than traditional GEO satellites. Current total GEO capacity is several terabits per second (tbps).

- Our first constellation alone will provide **7 tbps in 2020**.
- Our second constellation will provide **160 tbps in 2022**.





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47 C.F.R. §§ 0.457 and 0.459**



# We Will Succeed Where Others Have Failed

Over \$4 billion invested already, and in our mission to fully bridge the digital divide by 2027, we will potentially invest over \$30 billion.



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Access to OneWeb's services will be incredibly simple. Small, lightweight, very low-energy terminals will be easy to install and be a game-changer for rural Americans, those with intermittent power, and those in emergency situations.





Our business model is simple:  
partner with small, local ISPs for price determination and last mile delivery, because they know the local market best. This spurs innovation, entrepreneurship, and competition.

It is all part of our plan to ensure that all of rural America, all of America's schools and school children, and American small businesses are connected to the internet at broadband speeds.

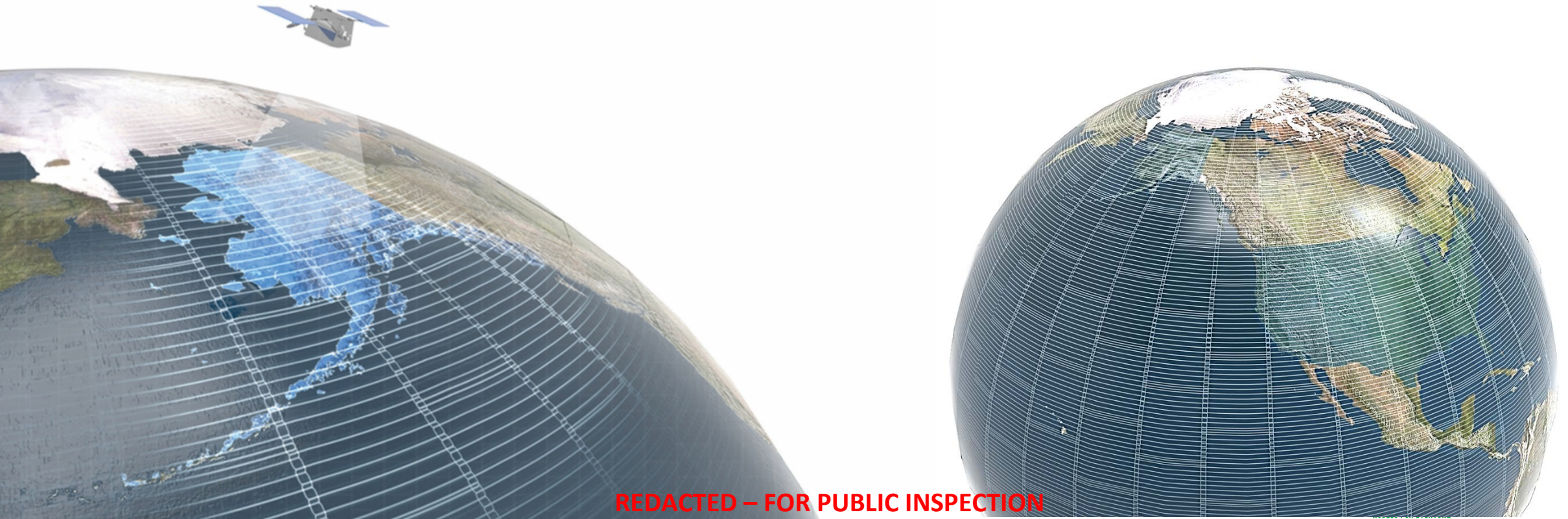
By connecting American small businesses while bridging the global digital divide, we can connect and foster markets at a scale never before achieved – bringing in billions of the previously unconnected.



In 2019, we will fully cover Alaska...

In 2020, we will fully cover America and much of the world

Initial speeds of 500 Mbps, with speeds of 2.5 Gbps by 2021





OneWeb's Satellites will not only augment and expand 4G LTE...

**They will be foundational for 5G**

**The Internet of Things, Connected Vehicles, Telemedicine, and Online Education**

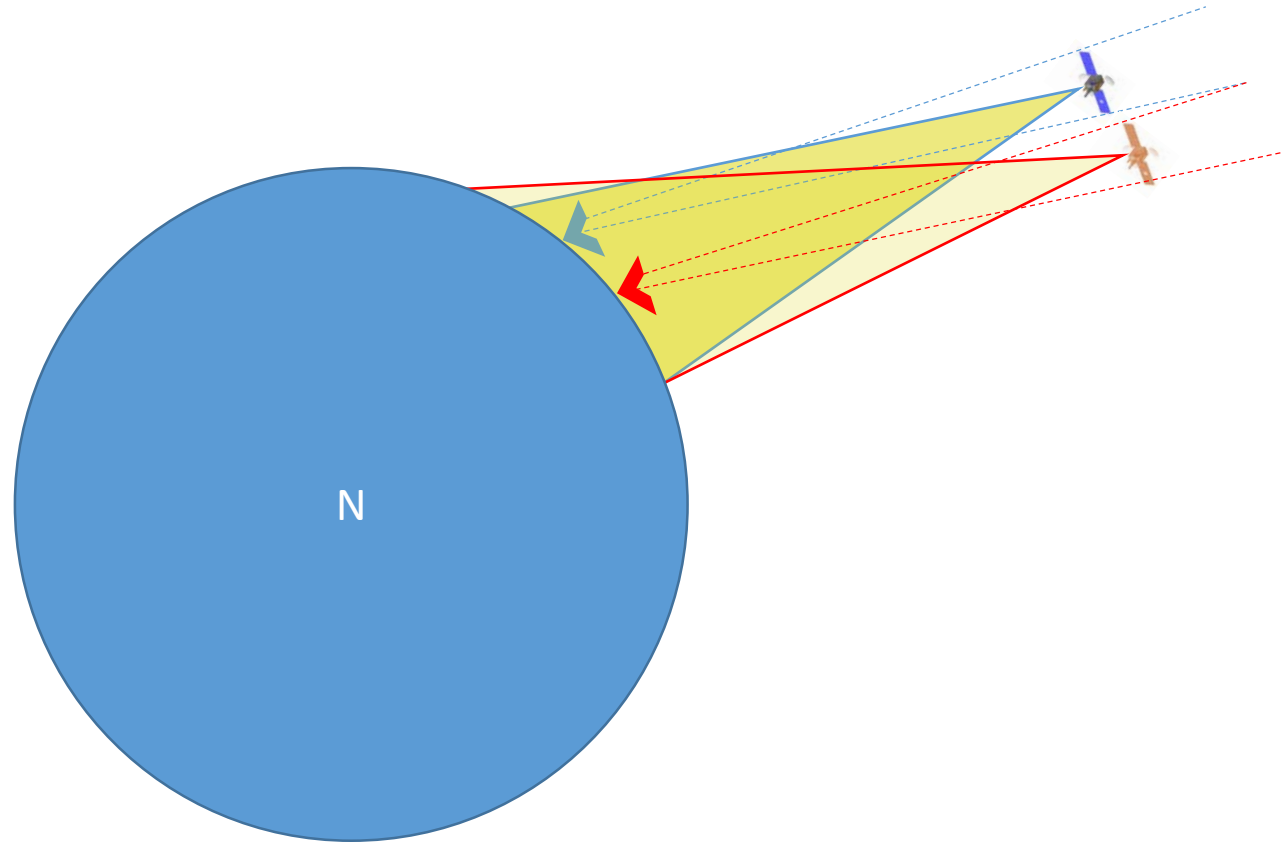
5G will be faster (100x faster than 4G), support more devices (100x more than today's networks), and respond in real-time (5x faster response time).

OneWeb Satellite's will be the backbone for service provisions in this new generation of network technology, particularly ensuring that rural areas are connected and benefit from these advances.



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# Our Operations Require Debris Free Space...

## So We Invested In:


- Pre-Planned Orbital Interval Spacing
- State-of-the-art onboard GPS Sensors
- Ground-Tracking Systems
- On-Board Propulsion Systems
- Casualty-free De-orbiting capability
- and Automatic De-Orbiting Technology




# OneWeb chose an altitude clear of other constellations

- Safe altitude separation is required
- Overlapping planes have a much higher likelihood of collision
- Any collision will cause a space sandstorm
- Sandstorms should not reach other constellations
- Other constellation have asked to overlap with OneWeb



 = 10 satellites

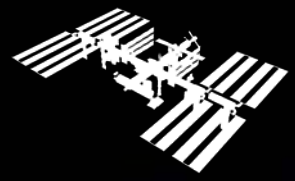
 = 10 satellites

2,000km


LEO


450km

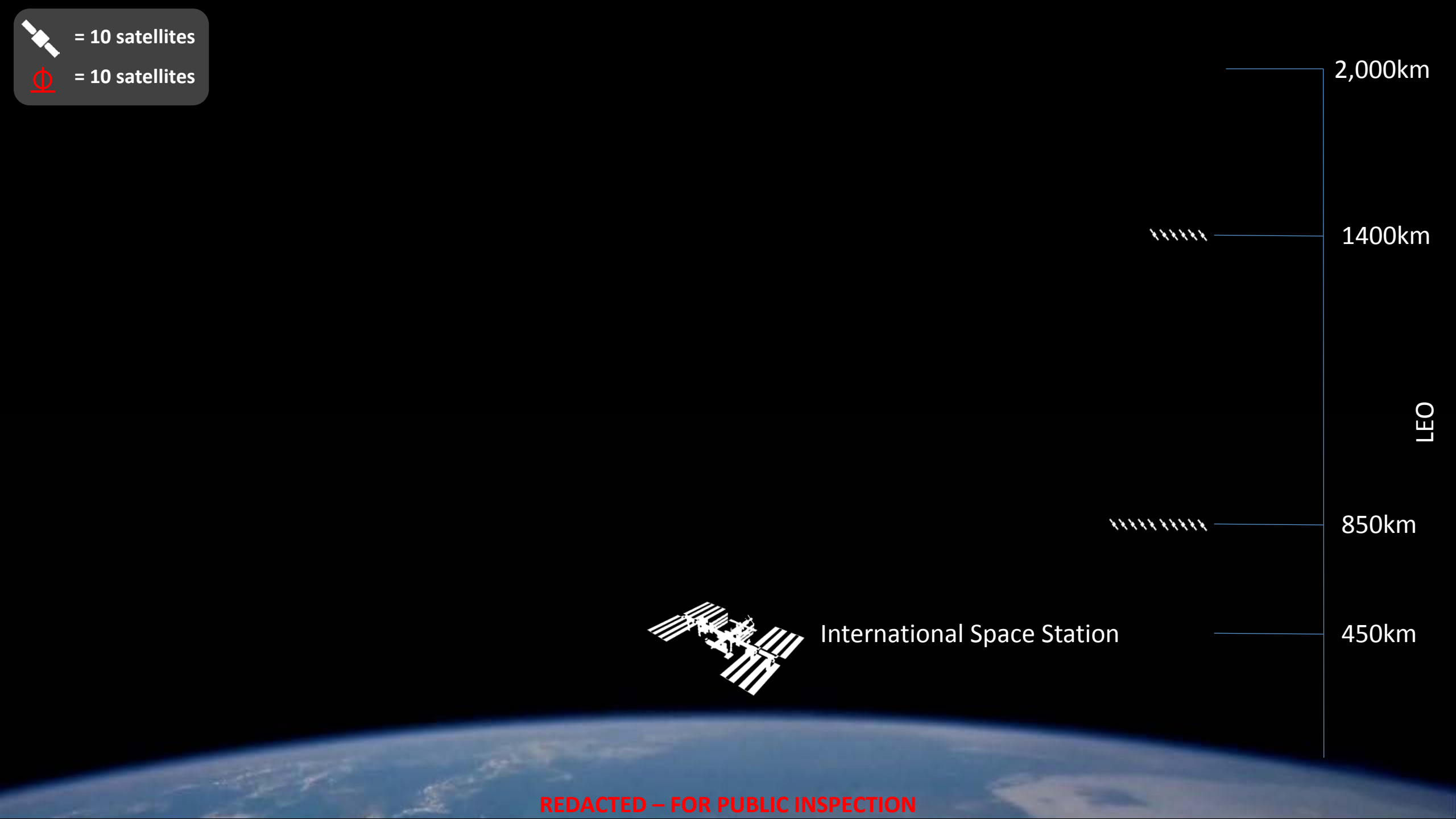
International Space Station







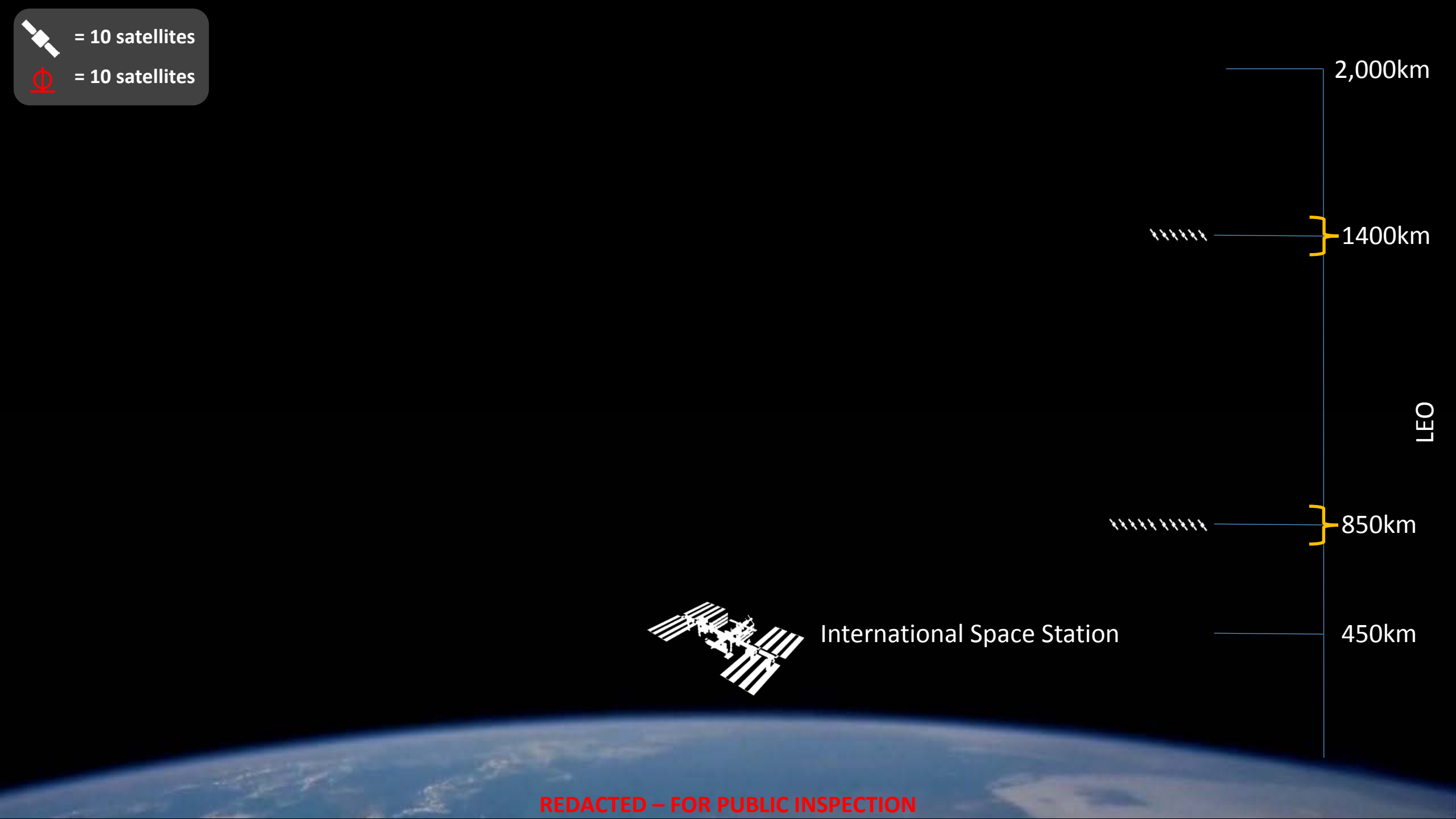
 = 10 satellites

 = 10 satellites





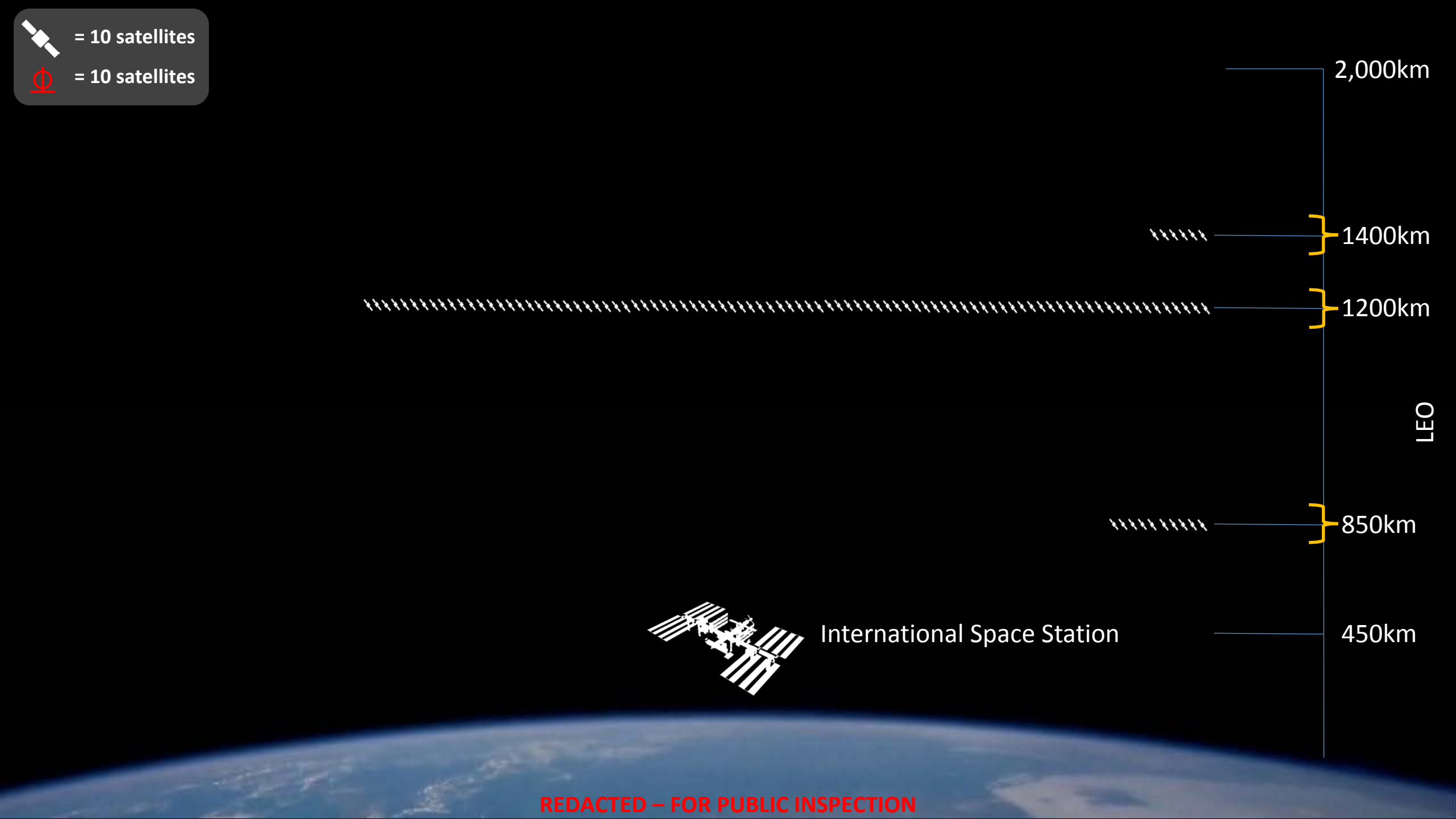


 = 10 satellites  
 = 10 satellites





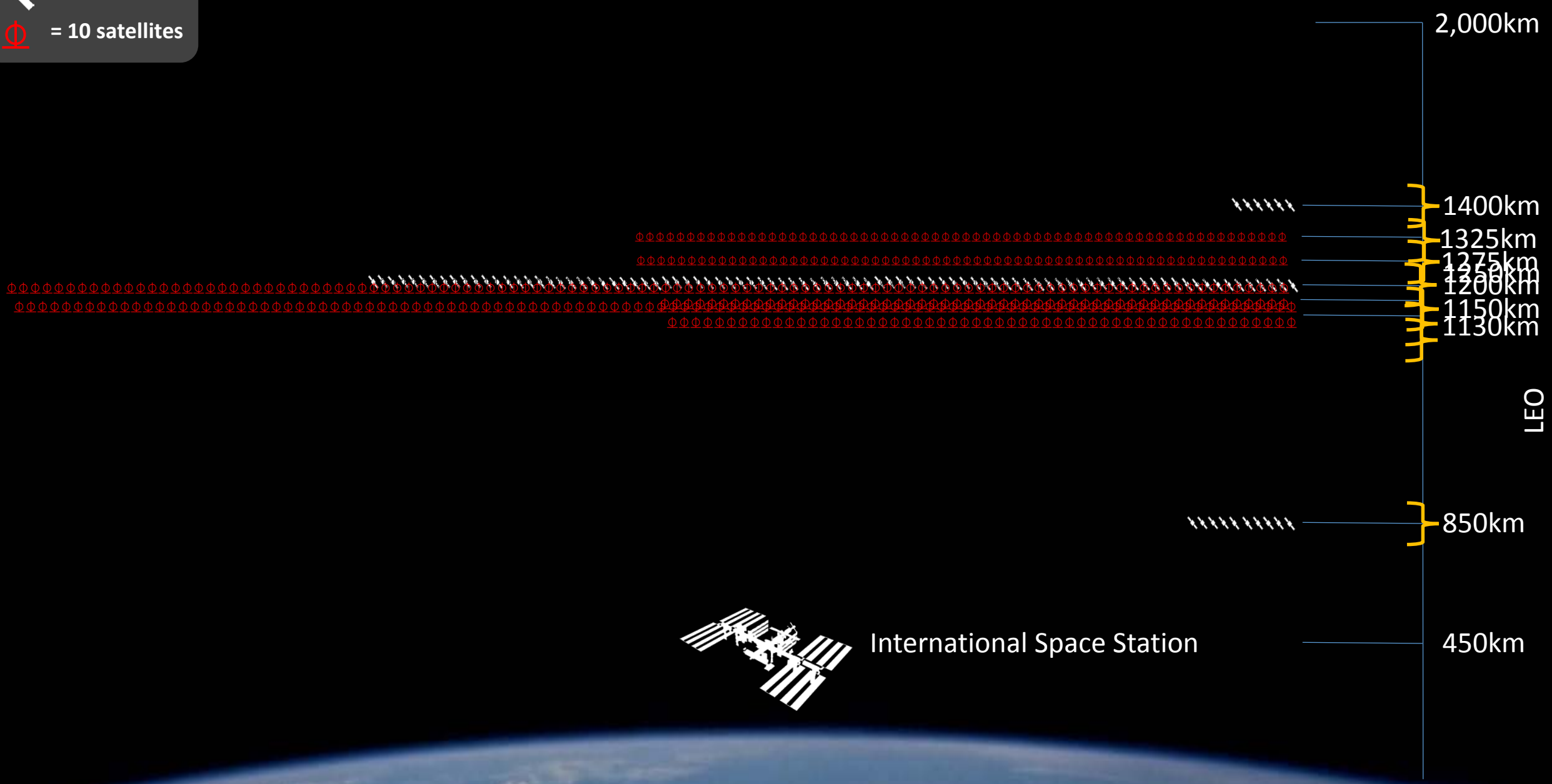


 = 10 satellites  
 = 10 satellites







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 = 10 satellites

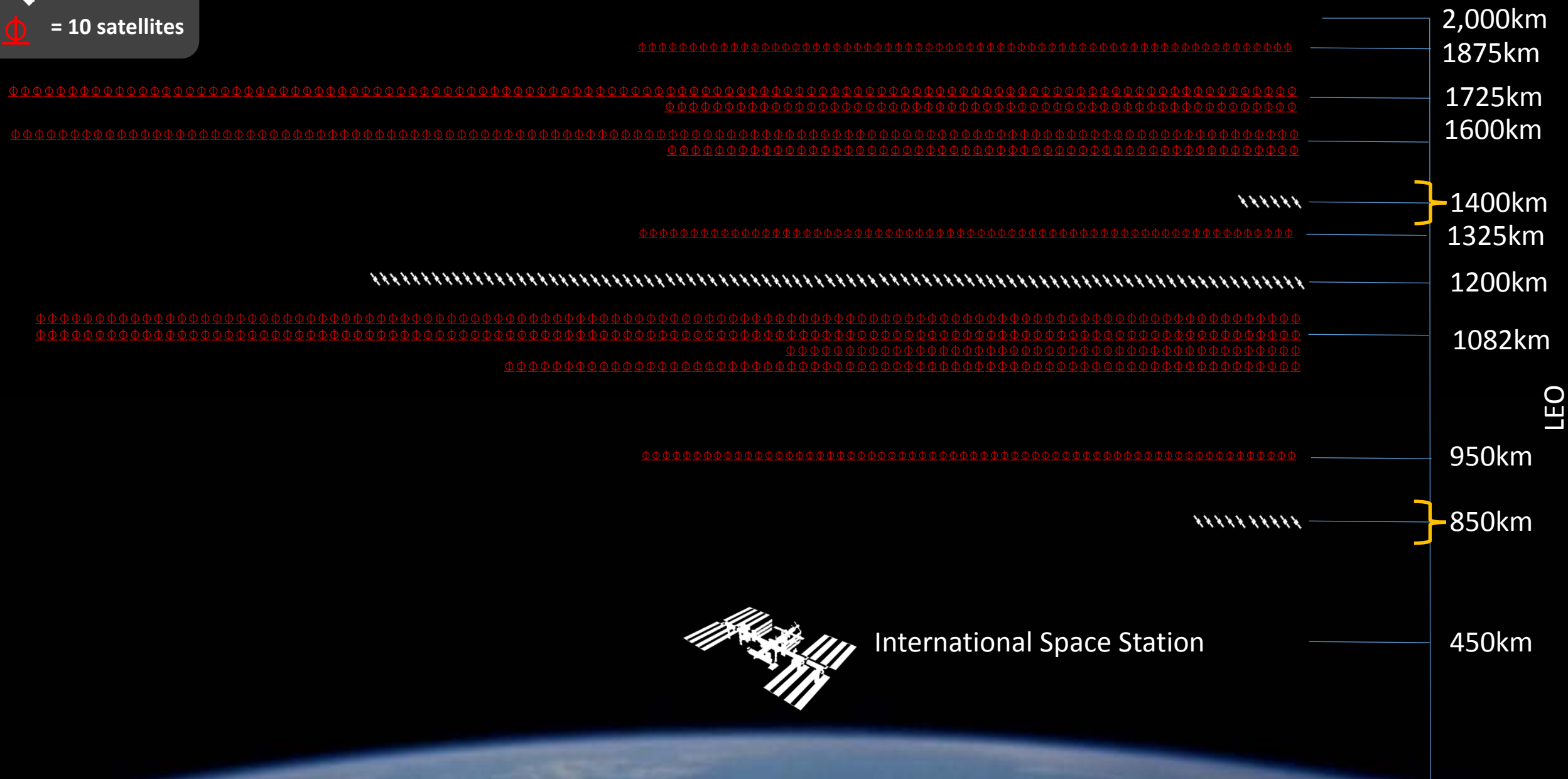
 = 10 satellites





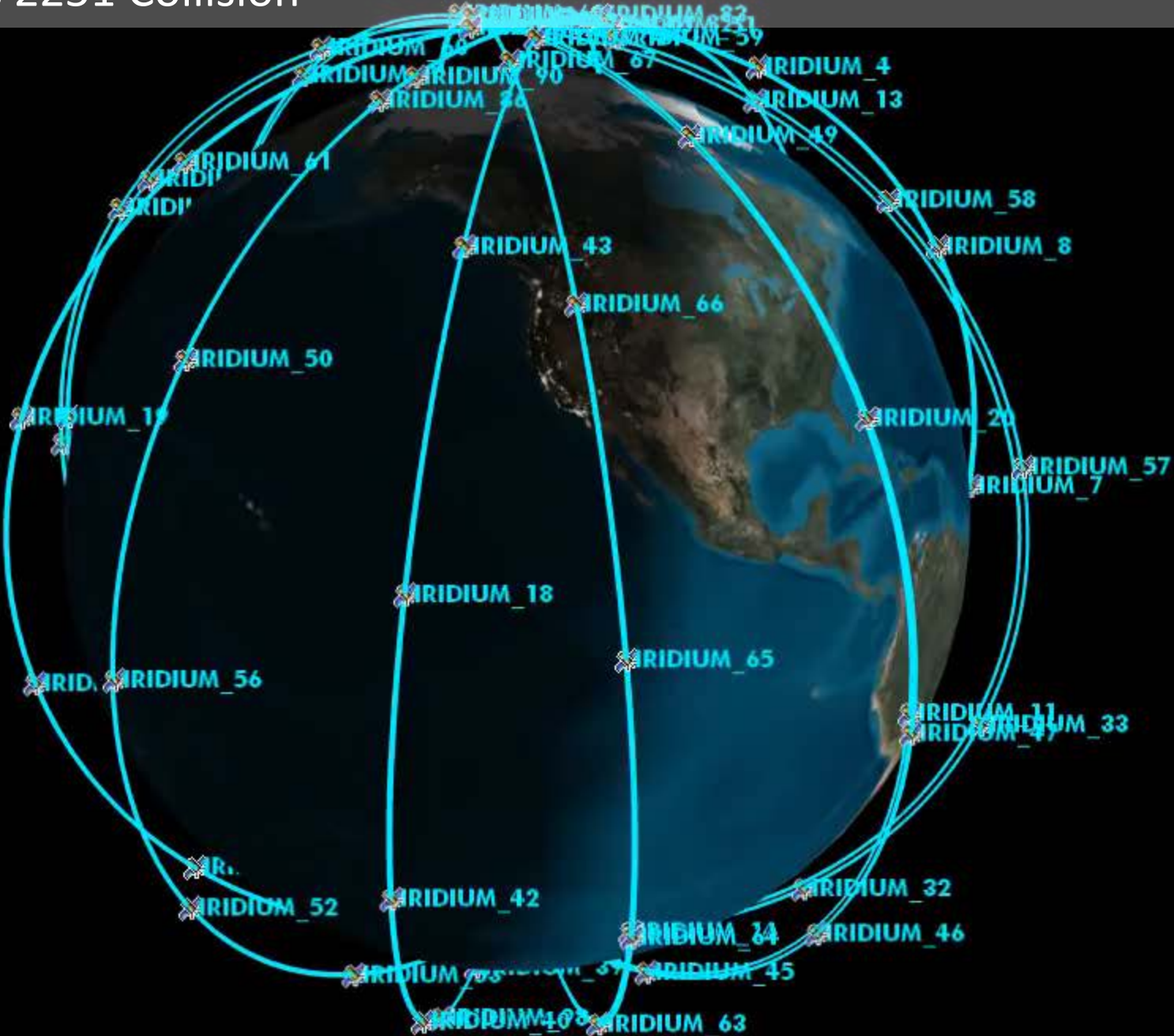
 = 10 satellites

 = 10 satellites





# Iridium 33 and Cosmos 2251 Collision

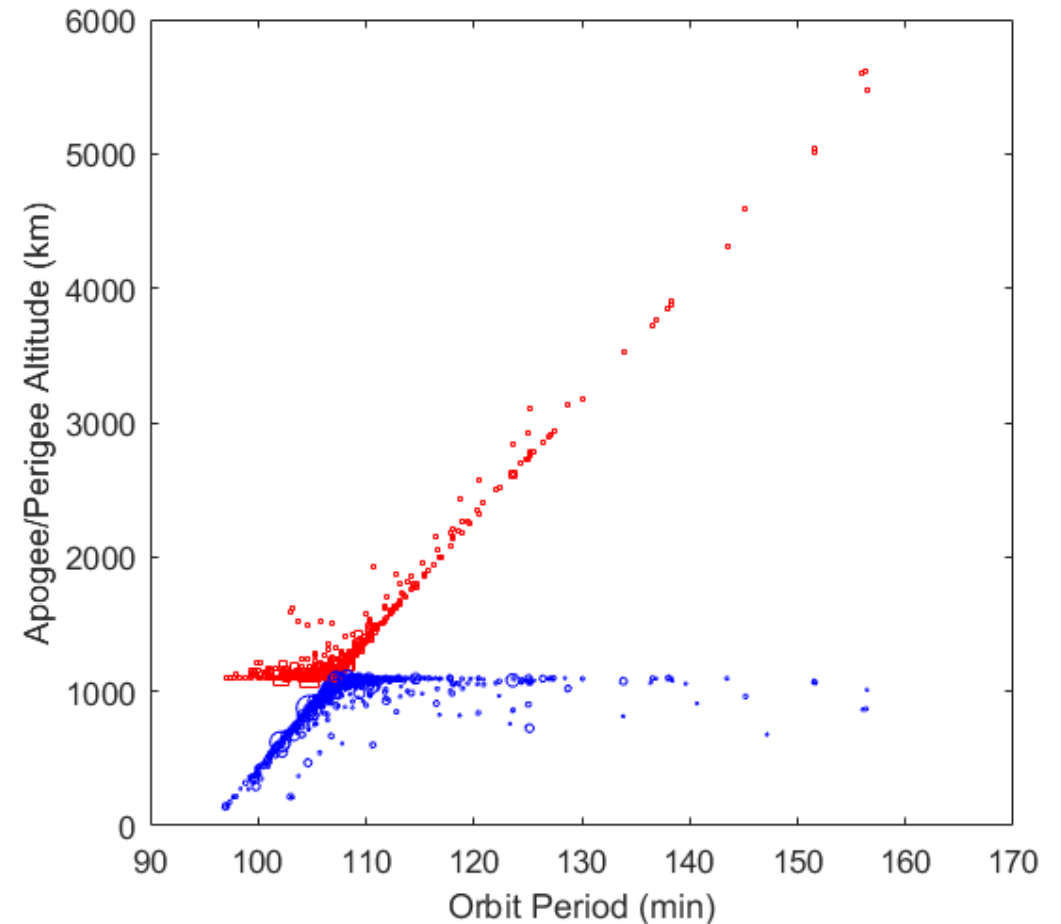


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# NASA Standard Breakup Model used to simulate collision

- Sample run simulates collision of two, 500 kg satellites
- Both satellites originally in circular orbits at 1,100 km
- Plots apogee and perigee vs. orbit period (two points/fragment)
- Red square: apogee
- Blue circle: perigee
- Size of marker correlates to size of fragment
- Vertex is location of collision







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